

In the Specification:

Please replace the Abstract with the following replacement Abstract.

A process for the removal of hydrogen sulfide and mercaptans from a gas stream containing a high ratio of mercaptans to hydrogen sulfide, wherein the first step removes hydrogen sulfide by washing the gas stream with an aqueous washing solution comprising water, a physical solvent and a chemical solvent. The first removal step is followed by a second removal step by which mercaptans are removed from the washed gas stream by means of molecular sieves.